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# DO DEMOGRAPHICS MATTER? A STUDY ON CONSUMER RESPONSE TO NEUROMARKETING STIMULI IN SAGAR DISTRICT

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## ABSTRACT

This study investigates the effects of demographic characteristics on consumer responses to neuromarketing stimuli among 228 respondents in Sagar District. Using a cross-sectional survey design, the research examines how age, gender, income, and education influence consumer responsiveness to neuromarketing techniques. Data were analyzed using SPSS with chi-square tests, ANOVA, and regression analysis. Results indicate that demographic factors significantly influence consumer responses to neuromarketing stimuli, with age and education emerging as the strongest predictors. Younger consumers demonstrated higher engagement with visual and emotional marketing stimuli compared to older age groups. Gender differences were observed in attention allocation patterns, with males showing greater responsiveness to rational appeals and females to emotional content. Education level significantly predicted overall neuromarketing responsiveness, while income showed moderate effects. These findings have important implications for marketers developing targeted campaigns in emerging markets and contribute to the growing literature on consumer neuroscience in non-Western contexts.

**KEYWORDS:** Neuromarketing, Demographics, Consumer Behavior, Neuromarketing Stimuli, Gender.

## 1. INTRODUCTION

Neuromarketing represents the intersection of neuroscience and marketing, employing neurophysiological techniques to understand consumer decision-making processes that traditional market research cannot capture (Rawnaque et al., 2020; Shaw & Bagozzi, 2018).

The field has experienced exponential growth, with the global neuromarketing market valued at approximately $3.3 billion in 2023 (Mordor Intelligence, 2023). Unlike conventional marketing research relying on self-reported data, neuromarketing utilizes objective measures such as functional magnetic resonance imaging (fMRI), electroencephalography (EEG), eye-tracking, and galvanic skin response to assess genuine consumer reactions (Oliveira et al., 2022). Demographic variables including age, gender, income, and education fundamentally shape consumer perceptions, motivations, and purchasing decisions (Martins et al., 2012). However, the integration of demographic analysis with neuromarketing approaches remains underexplored, particularly in emerging markets such as India. Understanding how demographic factors moderate neural responses provide critical insights for practical marketing applications (Karmarkar et al., 2015). Previous research establishes that structural brain differences between genders influence consumer decisions, with women demonstrating enhanced emotional processing and men showing greater focus on functional attributes (Birknerová et al., 2017; Vecchiato et al., 2014). Age-related research reveals younger consumers prioritize novelty while older adults focus on emotionally meaningful experiences (Carstensen et al., 2003). Educational attainment links to information processing efficiency (Vipul, 2010), while income levels directly affect purchasing power and brand preferences (Zeithaml, 1985). This study addresses the critical gap in understanding how demographic factors interact with consumer responses to neuromarketing stimuli in an Indian regional context. By examining these relationships in Sagar District, Madhya Pradesh—a microcosm of India's evolving consumer landscape—the research contributes theoretical insights and practical guidance for marketers in demographically diverse markets.

## 2. Literature Review

### Neuromarketing: Foundations and Applications

Neuromarketing integrates neuroscience methodologies with marketing theories to examine the cognitive, attentive, and emotional processes underlying consumer preferences and purchasing behavior (Doma & Pirouz, 2020). This approach emerged from the understanding that approximately 95% of consumer decisions occur subconsciously, beyond traditional market research methods (Harvard Business Review, 2023). Gerald Zaltman pioneered the field in the late 1990s through the Zaltman Metaphor Elicitation Technique (ZMET), which utilized carefully selected images to evoke emotional responses and activate purchase-related metaphors (Zaltman, 2003). Research applications demonstrate significant insights across marketing domains. Neural activation patterns predict brand preferences more accurately than

self-reported attitudes (Plassmann et al., 2012), while neurophysiological responses to advertisements correlate with purchasing behavior and sales performance (Kühn et al., 2016). Studies show that brain responses to package design elements influence product selection, and neural measures capture willingness-to-pay more accurately than surveys, potentially increasing estimated price tolerance by up to 15% (Ramsøy et al., 2018).

**Demographic Influences on Consumer Behavior**

Demographic characteristics such as age, gender, income, and education systematically influence consumer perceptions, motivations, and decision-making processes (Sheth, 1977). Age effects are explained by socioemotional selectivity theory, which suggests that younger adults focus on knowledge acquisition and future achievement, while older adults emphasize emotionally meaningful experiences (Carstensen et al., 2003). Older consumers respond more favorably to emotional appeals and demonstrate enhanced recall of positive information, whereas younger consumers show greater receptiveness to innovation and risk-taking (Williams & Drolet, 2005; Thaichon & Quach, 2016). Gender differences stem from neuroanatomical and neurophysiological variations between male and female brains (Brizendine, 2006). Women demonstrate larger prefrontal cortices associated with emotional regulation and social cognition, leading to greater emphasis on relational factors in purchases (McClure et al., 2004). Men exhibit stronger activation in regions associated with spatial processing and abstract reasoning, correlating with focus on product features (Meyers-Levy & Loken, 2015). Neuromarketing studies reveal that females show enhanced activation in emotional processing areas, while males respond more strongly to movement and technical specifications (Vecchiato et al., 2014). Educational attainment influences consumer behavior through enhanced information processing capacity and sophisticated decision-making heuristics (Beatty & Smith, 1987). Higher education correlates with increased media literacy and more critical evaluation of advertising claims (Petty & Cacioppo, 1986). However, the relationship is complex, with some studies suggesting educated consumers demonstrate increased impulsive purchasing due to confidence, while others report enhanced deliberative processing (Vipul, 2010; Shukla et al., 2011). Income directly affects purchasing power and consumption patterns (Zeithaml, 1985). Higher-income consumers demonstrate greater willingness to pay premium prices for quality and prestige, while lower-income consumers prioritize value and functionality (Goldsmith et al., 1998). Emerging evidence suggests socioeconomic status influences neural responses to product stimuli and pricing information (Karmarkar et al., 2021).

**Integration of Demographics and Neuromarketing**

The intersection of demographic segmentation and neuromarketing represents an evolving research frontier (Venkatraman et al., 2015). Gender-targeted research reveals that advertisement effectiveness depends on matching content to gender-specific processing styles, with gender-congruent product-voice combinations activating visual encoding regions more strongly (Casado-Aranda et al., 2018). Age-specific investigations show systematic differences in attention allocation and emotional processing, with older consumers demonstrating fewer fixations when viewing digital content and enhanced responses to emotionally positive stimuli (Chen et al., 2022; Fung & Carstensen, 2003). Research examining education and income effects on neuromarketing responses remains limited, representing a significant literature gap requiring further investigation.

## 3. Research Objectives

- To assess the effects of demographic factor on consumer responses to neuromarketing stimuli.
- To identify the key demographic predictors of consumer responsiveness to neuromarketing stimuli.

## 4. Research Methodology

### 4.1 Research Design

This study employed a quantitative, cross-sectional survey design to investigate the relationship between demographic characteristics and consumer responses to neuromarketing stimuli. The target population consisted of adult consumers aged 18 years and above residing in Sagar District who have been exposed to marketing communications through various media channels. The study employed a sample of 228 respondents, determined using Cochran's formula for cross-sectional studies with unknown population proportions. Multistage sampling was utilized, combining stratified and convenience sampling techniques.

### 4.2 Data Collection Instruments

A structured questionnaire employed a 28 items Neuromarketing Response Scale adapted from validated instruments in the neuromarketing literature (Ohme et al., 2009; Vecchiato et al., 2014). This scale assessed four dimensions: visual attention to marketing stimuli (7 items), emotional engagement with advertisements (8 items), memory recall of marketing messages (7 items), and purchase intention influenced by marketing (6 items). All items were

rated on a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The instrument demonstrated strong internal consistency, with a Cronbach's alpha of 0.89.

### 4.3 Data Collection and Analysis

Data were collected over eight weeks (August -September 2025) and analyzed using IBM SPSS Statistics 26. Descriptive statistics. Chi-square tests examined associations between categorical variables, while ANOVA with Tukey HSD assessed group differences. Multiple regression evaluated demographic predictors of neuromarketing responsiveness. Scale reliability was tested using Cronbach's alpha. Statistical significance was evaluated at $p < 0.05$ level, with effect sizes reported using eta-squared ($\eta^2$) for ANOVA and standardized beta coefficients ($\beta$) for regression analyses.

## 5. RESULTS

### 5.1 Demographic Profile of Respondents

**Table 1: Demographic Characteristics of Respondents. (N=228)**

| Demographic Variable | Category | Frequency | Percentage |
|---|---|---|---|
| **Gender** | Male | 134 | 59.0% |
| | Female | 94 | 41.0% |
| **Age** | Below 25 years | 96 | 42.1% |
| | 25-35 years | 71 | 31.1% |
| | 36-45 years | 41 | 18.0% |
| | Above 45 years | 20 | 8.8% |
| **Education** | High School | 52 | 22.8% |
| | Graduate | 103 | 45.2% |
| | Postgraduate | 73 | 32.0% |
| **Monthly Income** | Below ₹20,000 | 64 | 28.1% |
| | ₹20,000-40,000 | 87 | 38.2% |
| | ₹40,000-60,000 | 55 | 24.1% |
| | Above ₹60,000 | 22 | 9.6% |

The sample comprised predominantly male respondents (59%) and individuals below 35 years of age (73.2%), reflecting the demographic structure of active consumers in the region. Nearly half of the respondents held graduate degrees (45.2%), with an additional third having completed postgraduate education (32%), indicating a relatively educated sample. The majority of respondents reported monthly household incomes between ₹20,000-60,000 (62.3%), representing middle-class consumers.

### 5.2 Descriptive Statistics of Neuromarketing Response Dimensions

**Table 2: Mean Scores on Neuromarketing Response Dimensions**

| Dimension | M | SD | Min | Max |
|---|---|---|---|---|
| Visual Attention | 3.68 | 0.82 | 1.43 | 5.00 |
| Emotional Engagement | 3.52 | 0.91 | 1.25 | 5.00 |
| Memory Recall | 3.41 | 0.88 | 1.14 | 5.00 |
| Purchase Intention | 3.29 | 0.94 | 1.00 | 5.00 |
| **Overall Responsiveness** | **3.48** | **0.78** | **1.46** | **4.93** |

**Note:** M = Mean; SD = Standard Deviation

Respondents demonstrated moderate to moderately-high levels of responsiveness across all neuromarketing dimensions (M = 3.48, SD = 0.78). Visual attention received the highest mean score (M = 3.68, SD = 0.82), suggesting that visual marketing stimuli effectively capture consumer attention. Purchase intention showed the lowest mean (M = 3.29, SD = 0.94), indicating that while consumers attend to and engage with marketing stimuli, conversion to purchase intent involves additional considerations.

### 5.3 Gender Differences in Neuromarketing Responses

**Table 3: Gender Differences in Neuromarketing Response Dimensions.**

| Dimension | Male (n=134) | Female(n=94) | t-value | p-value | Cohen's d |
|---|---|---|---|---|---|
| | M (SD) | M (SD) | | | |
| Visual Attention | 3.58 (0.79) | 3.82 (0.84) | -2.14 | 0.033 | 0.29 |
| Emotional Engagement | 3.32 (0.87) | 3.81 (0.89) | -3.98 | <0.001 | 0.56 |
| Memory Recall | 3.47 (0.85) | 3.32 (0.92) | 1.25 | 0.214 | 0.17 |
| Purchase Intention | 3.41 (0.91) | 3.12 (0.96) | 2.28 | 0.024 | 0.31 |
| **Overall Responsiveness** | **3.45 (0.74)** | **3.52 (0.83)** | **-0.68** | **0.497** | **0.09** |

Significant gender differences emerged in specific dimensions of neuromarketing response. Female respondents demonstrated significantly higher emotional engagement with marketing stimuli (M = 3.81, SD = 0.89) compared to males (M = 3.32, SD = 0.87; t = -3.98, $p < 0.001$, d = 0.56), representing a medium effect size. This finding aligns with neurophysiological research documenting enhanced emotional processing in female brains (Vecchiato et al., 2014). Females also showed higher visual attention scores (M = 3.82, SD = 0.84) than males (M = 3.58, SD = 0.79; t = -2.14, p = 0.033, d = 0.29), consistent with eye-tracking research demonstrating broader visual scanning patterns among women (Meyers-Levy & Maheswaran, 1991). Conversely, males reported significantly higher purchase intention (M = 3.41, SD = 0.91) compared to females (M = 3.12, SD = 0.96; t = 2.28, p = 0.024, d = 0.31). This pattern suggests that while females demonstrate greater emotional engagement with

marketing stimuli, males show more direct conversion to purchase consideration, potentially reflecting gender differences in decision-making styles. No significant gender difference was observed in memory recall ($p = 0.214$).

### 5.4 Age Effects on Neuromarketing Responses

**Table 4: One-Way ANOVA Results for Age Group Differences.**

| Dimension | Below 25 | 25-35 | 36-45 | Above 45 | F | p | $\eta^2$ |
|---|---|---|---|---|---|---|---|
| Visual Attention | 3.89 (0.71) | 3.64 (0.82) | 3.42 (0.88) | 3.15 (0.96) | 8.42 | <0.001 | 0.101 |
| Emotional Engagement | 3.72 (0.84) | 3.51 (0.91) | 3.28 (0.95) | 2.98 (1.02) | 6.35 | <0.001 | 0.079 |
| Memory Recall | 3.58 (0.81) | 3.39 (0.87) | 3.21 (0.93) | 3.02 (0.99) | 4.12 | 0.007 | 0.052 |
| Purchase Intention | 3.45 (0.87) | 3.28 (0.92) | 3.11 (0.98) | 2.87 (1.08) | 3.68 | 0.013 | 0.047 |
| **Overall Responsiveness** | **3.66 (0.69)** | **3.45 (0.78)** | **3.26 (0.84)** | **3.01 (0.93)** | **7.89** | **<0.001** | **0.096** |

Significant age-related differences emerged across all neuromarketing response dimensions. Younger consumers (below 25 years) consistently demonstrated the highest responsiveness, with scores declining progressively across older age groups. The effect was most pronounced for visual attention ($F(3,224) = 8.42$, $p < 0.001$, $\eta^2 = 0.101$) and emotional engagement ($F(3,224) = 6.35$, $p < 0.001$, $\eta^2 = 0.079$). Post-hoc Tukey tests indicated that the youngest group scored significantly higher on visual attention, while the oldest group scored lowest on emotional engagement. Overall responsiveness showed a significant negative linear relationship with age ($r = -0.31$, $p < 0.001$), consistent with prior evidence of age-related declines in attentional capacity and motivational shifts (Chen et al., 2022; Yoon et al., 2005; Fung & Carstensen, 2003).

### 5.5 Education Level Effects on Neuromarketing Responses

**Table 5: Education Level Differences in Neuromarketing Responses**

| Dimension | High School | Graduate | Postgraduate | F | p | $\eta^2$ |
|---|---|---|---|---|---|---|
| Visual Attention | 3.42 (0.89) | 3.68 (0.79) | 3.87 (0.75) | 5.24 | 0.006 | 0.045 |
| Emotional Engagement | 3.18 (0.95) | 3.54 (0.88) | 3.76 (0.85) | 7.82 | <0.001 | 0.065 |
| Memory Recall | 3.08 (0.92) | 3.41 (0.85) | 3.69 (0.79) | 9.47 | <0.001 | 0.078 |
| Purchase Intention | 2.96 (0.98) | 3.32 (0.91) | 3.52 (0.86) | 6.89 | 0.001 | 0.058 |
| **Overall Responsiveness** | **3.16 (0.84)** | **3.49 (0.75)** | **3.71 (0.68)** | **11.24** | **<0.001** | **0.091** |

Education level demonstrated significant positive effects on all neuromarketing response dimensions. Postgraduate-educated respondents showed the highest responsiveness, followed by graduates, with high school-educated respondents scoring lowest. The effect was most pronounced for memory recall ($F(2,225) = 9.47$, $p < 0.001$, $\eta^2 = 0.078$) and overall responsiveness ($F(2,225) = 11.24$, $p < 0.001$, $\eta^2 = 0.091$). Post-hoc comparisons revealed that postgraduate respondents scored significantly higher than high school respondents across all dimensions (all $p < 0.01$), while graduate respondents showed intermediate scores. Although this pattern contrasts with prior findings suggesting reduced persuasion susceptibility among highly educated consumers (Petty & Cacioppo, 1986), the results support evidence that higher education enhances cognitive processing and engagement with marketing stimuli (Beatty & Smith, 1987; Gilly et al., 1998; Vipul, 2010).

### 5.6 Income Effects on Neuromarketing Responses

**Table 6: Income Level Differences in Neuromarketing Responses.**

| Dimension | Below ₹20k | ₹20k-40k | ₹40k-60k | Above ₹60k | F | p | $\eta^2$ |
|---|---|---|---|---|---|---|---|
| Visual Attention | 3.54 (0.87) | 3.64 (0.81) | 3.78 (0.76) | 3.92 (0.72) | 2.18 | 0.092 | 0.028 |
| Emotional Engagement | 3.38 (0.93) | 3.49 (0.91) | 3.65 (0.86) | 3.81 (0.82) | 2.45 | 0.064 | 0.032 |
| Memory Recall | 3.26 (0.91) | 3.38 (0.88) | 3.52 (0.83) | 3.69 (0.79) | 2.89 | 0.037 | 0.037 |
| Purchase Intention | 3.08 (0.96) | 3.26 (0.93) | 3.44 (0.89) | 3.68 (0.84) | 4.12 | 0.007 | 0.052 |
| **Overall Responsiveness** | **3.32 (0.82)** | **3.44 (0.78)** | **3.60 (0.73)** | **3.78 (0.68)** | **3.54** | **0.016** | **0.045** |

Income level showed moderate effects on neuromarketing responses, with significant differences observed in memory recall, purchase intention, and overall responsiveness. Respondents with higher incomes (above ₹60,000) demonstrated the highest scores across all dimensions, while those with incomes below ₹20,000 showed the lowest responsiveness. The most substantial income effect appeared in purchase intention ($F(3,224) = 4.12$, $p = 0.007$, $\eta^2 = 0.052$), where higher-income respondents showed significantly greater willingness to convert marketing exposure into purchase consideration. This pattern likely reflects the greater purchasing power and brand accessibility available to higher-income consumers (Zeithaml, 1985). Post-hoc tests revealed that respondents earning above ₹60,000 scored significantly higher than those earning below ₹20,000 on purchase intention ($p < 0.01$). While visual attention and emotional engagement showed trends favoring higher-income groups, these differences did not reach statistical significance ($p = 0.092$ and $p = 0.064$, respectively).

This suggests that income primarily influences behavioral outcomes (purchase intention) rather than initial attentional or emotional responses to marketing stimuli.

### 5.7 Multiple Regression Analysis: Demographic Predictors of Neuromarketing Responsiveness

**Table 7: Multiple Regression Analysis Predicting Overall Neuromarketing Responsiveness.**

| Predictor | B | SE | β | t | p | VIF |
|---|---|---|---|---|---|---|
| (Constant) | 2.14 | 0.21 | — | 10.19 | <0.001 | — |
| Gender (Female) | 0.12 | 0.09 | 0.08 | 1.33 | 0.185 | 1.08 |
| Age Group | -0.18 | 0.04 | -0.27 | -4.50 | <0.001 | 1.24 |
| Education Level | 0.31 | 0.05 | 0.38 | 6.20 | <0.001 | 1.18 |
| Income Level | 0.15 | 0.05 | 0.19 | 3.00 | 0.003 | 1.32 |

The multiple regression model explained 34% of variance in overall neuromarketing responsiveness ($R^2 = 0.34$, $F(4,223) = 28.64$, $p < 0.001$), indicating that demographic factors collectively account for substantial individual differences in consumer responses. Education level emerged as the strongest predictor ($\beta = 0.38$, $p < 0.001$), with each educational category increase associated with a 0.31-point increase in responsiveness, underscoring the importance of cognitive capacity in consumer engagement. Age was the second-strongest predictor ($\beta = -0.27$, $p < 0.001$), showing a 0.18-point decrease per age category, confirming that younger consumers demonstrate systematically higher responses to marketing stimuli. Income demonstrated a moderate positive effect ($\beta = 0.19$, $p = 0.003$), with a 0.15-point increase per income category, reflecting purchasing power's role in shaping engagement. Gender showed no significant independent effect ($\beta = 0.08$, $p = 0.185$), suggesting its influence operates through dimension-specific effects rather than overall responsiveness. All VIF values remained below 1.5, indicating no multicollinearity, with residuals approximating normality (Shapiro-Wilk $p = 0.082$) and homoscedasticity (Breusch-Pagan $p = 0.156$).

### 5.8 Chi-Square Analysis: Categorical Associations

**Table 8: Chi-Square Tests for Categorical Demographic Associations.**

| Variables | $\chi^2$ | df | p | Cramer's V |
|---|---|---|---|---|
| Gender × High Visual Attention | 12.34 | 1 | <0.001 | 0.23 |
| Gender × High Emotional Engagement | 15.67 | 1 | <0.001 | 0.26 |
| Age Group × High Overall Responsiveness | 18.42 | 3 | <0.001 | 0.28 |
| Education × High Memory Recall | 21.58 | 2 | <0.001 | 0.31 |
| Income × High Purchase Intention | 14.73 | 3 | 0.002 | 0.25 |

Chi-square analyses examining associations between demographic categories and dichotomized high-response indicators revealed significant relationships across all examined dimensions. Education showed the strongest association with high memory recall ($\chi^2 = 21.58$, $p < 0.001$, Cramer's V = 0.31), where 58% of postgraduate respondents achieved high memory recall scores compared to only 27% of high school respondents. Gender associations were significant for both visual attention ($\chi^2 = 12.34$, $p < 0.001$) and emotional engagement ($\chi^2 = 15.67$, $p < 0.001$), with 52% of females showing high emotional engagement compared to 31% of males. Age group demonstrated strong associations with overall responsiveness ($\chi^2 = 18.42$, $p < 0.001$), where 61% of respondents below 25 years showed high responsiveness compared to only 25% of those above 45 years.

## 6. DISCUSSION

This study provides comprehensive evidence that demographic characteristics significantly influence consumer responses to neuromarketing stimuli in the Sagar District context. The findings reveal complex patterns of association between age, gender, education, income, and various dimensions of neuromarketing responsiveness, with important theoretical and practical implications. The findings demonstrate a robust and statistically significant negative relationship between age and neuromarketing responsiveness. Younger consumers (below 35 years) exhibited higher levels of visual attention, emotional engagement, memory recall, and purchase intention. The magnitude of age effects was strongest for visual attention and emotional engagement, while comparatively weaker effects were observed for memory recall and purchase intention. These results are consistent with socioemotional selectivity theory (Carstensen et al., 2003) and align with prior neurophysiological evidence indicating age-related reductions in attentional capacity and visual scanning efficiency (Yoon et al., 2005; Chen et al., 2022). Gender differences were observed across specific response dimensions rather than overall responsiveness. Female respondents demonstrated significantly higher emotional engagement, corroborating prior neuroscientific research documenting stronger affective processing among women (Brizendine, 2006; McClure et al., 2004). In contrast, male respondents reported higher purchase intention despite lower emotional engagement, reflecting differentiated evaluative pathways in consumer decision-making (Meyers-Levy & Loken, 2015). However, gender did not exert a statistically significant independent effect in the multiple regression model, indicating that gender influences the configuration of neuromarketing responses rather than their aggregate magnitude (Casado-Aranda et al., 2018; Vecchiato et al., 2014). Education emerged as the most influential demographic determinant

of neuromarketing responsiveness, exhibiting positive associations across all measured dimensions and the largest standardized regression coefficient ($\beta = 0.38$). The strongest effect was observed for memory recall ($\eta^2 = 0.078$), suggesting enhanced encoding and retrieval processes among more educated consumers (Craik & Lockhart, 1972). These findings challenge assumptions that higher education reduces marketing susceptibility (Petty & Cacioppo, 1986) and instead indicate deeper cognitive engagement with marketing stimuli (Gilly et al., 1998; Ramsøy, 2019). Income demonstrated a moderate positive effect, particularly on purchase intention, reflecting the role of purchasing power in facilitating behavioral conversion (Zeithaml, 1985). The weaker influence of income on attentional and emotional dimensions suggests that economic factors become more salient at later decision stages, consistent with neuroeconomic evidence linking socioeconomic status to reward-related neural activation (Karmarkar et al., 2021). Collectively, demographic variables explained 34% of the variance in neuromarketing responsiveness, with predictor importance ranked as education, age, income, and gender.

### 6.2 Practical Implications

For marketers in Sagar District, the findings highlight the value of demographic-based segmentation. Younger consumers favor visually rich and emotionally engaging campaigns, while older consumers prefer simpler, personally relevant messages. Males respond more to functional benefits, whereas females engage with emotional storytelling. Education and income levels further shape preferences for message complexity and value cues, underscoring the importance of multi-variable demographic targeting.

### 6.3 LIMITATIONS

Several limitations qualify these findings. The study relied on self-reported neuromarketing responses rather than direct neurophysiological measures; future research using EEG, fMRI, or eye-tracking could strengthen biological validity. Its cross-sectional design limits causal inference, and the Sagar District sample restricts generalizability. Additionally, variations across product categories, advertising formats, and neuromarketing techniques were not examined. Finally, only demographic variables were considered, leaving psychographic, cultural, and neurophysiological influences unexplored.

## 7. CONCLUSION

This study provides robust evidence that demographic characteristics significantly influence consumer responses to neuromarketing stimuli. Younger, more educated, and higher-income

consumers demonstrate elevated responsiveness across multiple dimensions including visual attention, emotional engagement, memory recall, and purchase intention. Gender effects operate dimension-specifically, with females showing superior emotional engagement and visual attention, while males demonstrate higher purchase intention. The regression analysis revealed that education represents the strongest demographic predictor, followed by age, income, and gender, collectively explaining 34% of variance in overall responsiveness. These findings have important implications for marketing practitioners developing demographically targeted campaigns and contribute to the theoretical literature on consumer neuroscience in emerging market contexts. As neuromarketing techniques become increasingly accessible and prevalent in marketing practice, understanding how demographic characteristics moderate their effectiveness becomes crucial for both ethical and strategic reasons. The current findings suggest that demographic segmentation remains valuable for predicting and understanding consumer responses, but optimal targeting requires integration of multiple demographic dimensions and recognition of dimension-specific effects. Marketers who successfully navigate this complexity will be best positioned to develop efficient, effective campaigns that resonate with their target audiences while respecting the cognitive and emotional diversity of consumers.

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